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ABSTRACT

Following a brief history, rationale, and description of academic gaming, including game types and purposes, two case studies are presented in which game-plays of STARPOWER and THE ROAD GAME are observed and analyzed. In addition, practical suggestions for selecting, preparing for, and running a game and its post-play discussion are presented. For those educators interested in designing a new game or adapting an existing game, eight guidelines are discussed. An annotated bibliography, a selected bibliography, and a description of seven games suitable for the college level are included. (STS)

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ACADEMIC GAMING

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ACADEMIC GAMING

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"Dialogue inside grows out of dialogue with others; This is how society penetrates our thinking."

Simulation gaming is a quicksilver among learning activities--mobile, life-like, and elusive. Its conflicting emphases challenge us to look for a new coherent definition. Its complexity invites the partial and incomplete view, the dangerous simplification that restricts what goes on in the classroom or learning setting. A map is needed on which the conflicting claims and theories can be plotted.

In the map that emerges from our study of academic gaming, one dimension is historical. Among the images or models of gaming development that have been widely accepted in schools, three may be identified as useful to this review. The first centers on skills: it is consistent with the broad academic concern for skill training. The second stresses culture heritage, or the need to discover a civilizing and socially unifying content. The third model focuses on personal growth: on the need to reexamine the learning process and the meaning to the participant of what he is doing in a gaming situation. Looking back over the history of academic gaming, however brief, we see the limitations on the earlier models and thus the need to reinterpret our conception of "skills" and "heritage."

Within the past decade the proponents of academic gaming as a tool for teaching and research have focused critical attention on the many learning possibilities gaming offers player participants. Gaming offers both lively activity and thoughtful insight for both participants and game designer. The uniquely rich and varied personal culture of the student is brought to bear in gaming, and the moments gaming offers to order and compose situations that in some way symbolize life as we know it can bring order, composure and insight to our inner selves. In this sense, gaming belongs in the classroom the clinic, and home, as a legitimate method to explore personal culture and personal growth. This monograph suggests some of the dimensions of the serious mischief of gaming, a new and important learning activity.

BACKGROUND AND GROWTH

In his article, "A Theory of Social Comparison," Leon Festinger postulates that man has a need to have his opinions and abilities tested and evaluated by the reactions of others to him. Games serve such a purpose. Gaming evolved from such cultural events as religious ceremonies, warfare, mythology, fold customs, politics, and commerce. It has drawn from and contributed to resources of imagination, exploration, memory activity, and cooperation. Gaming contests have allowed running. laughing, and competing in forms of acceptable rational and social amusement. Many of the game forms followed in contemporary exercises have existed over the centuries. For example, Hopscotch, Blindman's Bluff, and Tug of War were as popular among children of ancient Rome as they are in schoolyards and playgrounds today. Indications of marbles, backgammon, and droughts have been discovered in the remains of most civilized areas.

The earliest recorded appearance of games is on wall murals in the tomb of Rashepsea, a scribe for King Tat-ka-ra of Egypt's Fifth Dynasty. The game closely resembles checkers with two players depicted seated opposite one another manipulating twenty-four pieces before them on a checkered surface. A game of mock warfare, chess, is probably the world's most ancient game of pure skill. Its origin is lost in the legends and traditions of the past. One theory is that chess was devised in India to divert man from waging war. The game was invented somewhere in the Far East and passed from India to Persia and then to Europe. The word "chess" is thought to be derived from "shah", Persian for king and "checkmate" from "shah mat," the king is dead. The chess connotation of black army versus white army is a popular theme in contemporary culture depicting human destiny as intwined with the progression of the chess figures.

Oriental varieties of chess with unusual moves and pieces attributed unusual powers were developed by the Chinese, Siamese, Burmese and Shogi (Japanese chess). Tamerlane played superchess using 56 pieces.

Fencing developed as a training method for swordsmanship and dueling. Weapons developed dull edges. Protective clothes, gloves and masks were worn. Etiquette was developed. The sword, the most romantic of weapons, was a symbol of war and a badge of courage among fighting men since the days when bronze and iron were first hammered into blades; declined as invention of firearms destroyed the usefulness of armor.

With the invention of gunpowder and improvements in military science a shift from frequent military aggression to more simulated competitions seemed logical. One evidence of such a switch occurred in the development of fencing as more of a training for dueling than actual encounter.

The need for improved military strategy was largely responsible for the development of war games. Such games expanded in the 18th, 19th, and 20th centuries because blunders in the battlefield became more and more intolerable with the passing of time. Players, usually officers in training, were given maps and wooden soldiers. Distances were based on the distance a modern cavalry brigade could ride in one minute. The genesis and evolution of war games are obscure but closely related to the outgrowth of chess and similar board games played for pleasure. Such games served as equivalents of warfare.

In 1798 the "Neue Kriegspiel", a true war game, was developed at Schleswig. The game involved analysis by participants of destructive topographical features and troop and cavalry mancuvers on a map divided with 3600 squares. A century later, the game had split into two types, one controlled by rigid rules, the other controlled by referees who observed the permissibility of moves. Popular in the military academies of Prussia, both types of games spread rapidly to other countries including Britain and the U.S. Such games were used extensively at West Point in the last quarter of the 19th century. Since the beginning of World War II, versions of Kriegspiel have been widely used especially by the Japanese and Germans. Most versions combined the forms of environmental and data bases. The United States, RAND and MIT pioneered strategy games in the 1950's using real-life, high-level military and government personnel as the decision-making participants. Players were confronted with potential causes and reactions were considered as policy-planning tools. Early gaming indicates that when participants venture outside the battlefield to strategic questions, the broad domain of social and political interactions are consulted.

Experimental social psychologists and sociologists have been interested in small group phenomenon since the mid 1930's. Gaming places a small group of people in a laboratory setting assigning them a task. Communicational patterns, interaction modes, perceptions, evolvement of leader and follower roles and problem-solving are all observable. Environmental and personal characteristics were found to interact in the

decision-making process. Such factors as role concept, personality and organization of the group are also parts of gaming interaction. In complex organizations, each component that is responsible for accomplishing an overall goal develops its own dynamics and objectives. By systematic analysis of the components, their functions, their objectives and the relationships among them, operations research enables a complex balance to be attained in which behavior contributes to the overall organizational goals. Systems research examines physical, biological, psychological, and sociological aspects of organizations functioning. Information theory has enabled scientists to progress in quantifying intangibles such as "purpose and goal seeking." Thus, we are able to represent, in part, at least such difficult abstractions in simulation.

In the contemporary economic, social, and political setting which encourages innovation, education and research, gaming and simulation, have invaded most fields which an understanding of human and social behavior is desired. Thus, not only in war and military operations, but also in management and business, economics and political science and international relations, sociology, education and psychology, considerable effort has been put into devising games and simulations.

The American Management Association developed the first widely used business and management game after its members visited the Naval War College. The AMA game involves team participation in basic decisions regarding selling prices, marketing budgets, research and development, expenditures, rates of production, plant capacity, and purchase of information about competitor behavior. Calculators and computers are used for computations. Games rapidly spread into management and graduate studies as an adjunct to "case studies."

Modeling in economics studies has been profitable. In part, this is because economists have been so successful in gathering data and specifying relationships among variables. The first serious effort to add a large scale economic simulation to physical and economic representations was evaluated in 1957. This work uses the household as the decisional unit on the basis of theories about household economic behavior combined with statistical information on economic trends. Designers plan to make such simulations sophisticated and accurate enough for long-range predictions. Researchers are also investigating "regional science," studying a specific geographic area by combining input-output analyses for that area with computer simulation of its economic system in order to forecast

individual development, resource use and demographic characteristics. According to 1965 estimates between 100 and 200 man years are spent annually in the U.S. on 28 to 30 economic simulations at a cost of between $2,000,000 to $4,000,000 per year.

The first serious attempt to build a computer simulation of a political system was made at the University of Oklahoma by Oliver Benson. Benson's game was a model that geared together war potential, aggressiveness, atomic capability, coalition, membership, possession of bases abroad, geographic locations and trade. At Northwestern University, a project contributed to the field of international leaders worrying about consumer good levels, national defense, public opinion, elections, revolutions, democratic values, threat and counter threat, alliances, war and military activities.

DESCRIPTION OF GAMING

In Games for Growth (Palo Alto, Calif.: Science Research Associates, Inc.), Alice Kaplan Gordon succinctly defines a game as "any simulated contest (play) among adversaries (players) operating under contraints (rules) for an objective (winning)" p. 8.

Another useful definition was by Puferson M. Shukik at a recent conference on gaming at the Rand Corporation: "Gaming--a gaming exercise employs human beings acting as themselves or playing simulated roles in an environment which is either actual or is simulated. The players may be experimented subjects whose behavior is being studied, or they may be participants in an exercise run for teaching, training, or operational purposes."

A simulation game, or educational game, as it is sometimes called, differs from the traditional commercially marketed game in two ways: first, an educational game simulates a real-life experience. (Games like Monopoly, although fulfilling all the requirements for what constitutes a game, does not validly simulate the American economic system although it certainly may satisfy the fantasies of many a financially frustrated suburbanite.) And second, winning in a simulation game is quite relative. Success is not necessarily the underlying objective. For instance a game designed to expose the participants to the complexities and frustrations of ghetto life may be most educational for even the losers.

Simulation games are a kind of "slice of life," a taste of an entire situation, event or process. A slice, of course, is not the whole pie. A simulation game must simplify and abstract the complex real scene if it is to be playable within the time and spatial constraints of a classroom setting. Some games, we note, are using computers to process more complex information, thus allowing the games' complexity and relation to the real world to be extended.

In summary, educational games can simulate dynamic, real-life activities or processes. The simulation is a simplified interaction which involves cooperation and competition.

There are various types of game formats. The most popular and most frequently employed structure for gaming is the board format. In educational games, the board usually graphically represents the simulation to be enacted.

Role-play games, a second gaming format, involves a good deal of personal interaction among participants who must bargain and negotiate in the simulation for their position or for groups they represent. Role-play games tend to de-emphasize the monopoly-like characteristics of a game, especially the heavy reliance on chance as a determining factor in the game's outcome. A role-play game might well resemble the game Poverty. The simulation is first described (in this instance, that of a local community), roles are distributed (black citizens, white citizens, a white policeman, a judge, a storekeeper, and a welfare agent); a goal is prescribed to make a collage of pictures; and resources, money for the storekeeper's supplies, participants in order that they can make their collage.

Each player enacts his role as he imagines it to be in the real life situation. Certain minimal rules are presented and the game begins. Closure of the Poverty comes when the collages are completed or when the human interactions break down to fisticuffs, which, incidentally, is occasionally the case with the more enthusiastic players. Game ended, it is then processed in a debriefing session.

Role-playing games can be more complex than Poverty and can involve computations, a welter of forms to be completed, meetings, discussions, utilization of various media, as well as much longer periods of time till the game closure is called.

The use of the computer has been able to add a new dimension to gaming. Capable of processing large amounts of information quickly, the computer has opened unexpanded simulations such as The City I Model, a man-computer game which simulates an urban system, effected by the private and public resources of the game's participants.

While a good deal of professional attention has been directed at the man-computer simulation experiences, learning games have stimulated little research. In this context, the games developed by Laymen Allen at the University of Michigan might be called learning games as opposed to simulation games. In contrast, the game of Ghetto would be called a social simulation game, versus Wff'N'Proof one of Allen's learning games.

Dr. Steven J. Kidder of Johns Hopkins University has suggested a useful framework for the optimal use of games in training and teaching. Kidder delineates three types of simulations: man, man-machine, and machine simulations. Learning games do not fall within any easy framework. However, they are a unique form of gaming that may effectively develop motor skills, intellectual skills or cognitive strategies. In fact, Kidder votes that learning games seem to be similar to the games teachers have been using for years that involve single motivational and competitive structures (Spelling Bee's, etc.).

When a teacher or trainer wishes to shift from the "pure" development of intellectual and cognitive skills to attitude, one might find a parallel shift (for optimal impact) from learning games (structured to increase motivation without role-playing within complex, simulated environments) to simulation games and free-form games (military type, operational games).

GAMING RATIONALE

It is often with much bewilderment that educators observe the intense enthusiasm children project into the playing of games. The classroom never seems to evidence the enthusiasm of a five-year old at play in his kindergarten world or the long-haired college frosh hard at play with a game of touch football on the campus green.

Each, the small child, or the 18-year old student is engaged in play that has a set of built-in rules, boundaries of time and space, and a realization that the game play behavior exists separate from their real life activities.

Educators have failed to see and then capitalize on the charisma that games seem to have for students. Perhaps at the kindergarten level, games form a core of learning possibilities, but much beyond that, games serve only as recess, a longed-for break for teachers and students alike, or a subtle bribe for students to endure the serious remainder of the day after having enjoyed a short fun-filled respite of gaming.

Fortunately, some observers of the learning process have startled the stodgy, often stuffy educational curricula by introducing the educational game. These pioneer innovators claim that game play can be used effectively beyond the boundaries of mere educational dessert, that games can really motivate, that games can teach or clarify concepts or processes, as well as aid in class socialization. Although the new gaming enthusiasts have not pushed gaming as some kind of Dr. Wonder remedy for all the learning aches and pains, they do see it as a viable way of satisfying many learning objectives at one time. They are convinced, very convinced that the rewards of gaming in the classroom often far exceed those obtained from more traditional attempts at teaching.

Let's examine some of the advantages that can accrue from game play.

Games for Motivation

Games can motivate. Educators are constantly searching for that certain spark which will enthuse a student, and turn the learning experience from one of dull, oppressive student-passive entropy to one of exciting, freeing, and student-active searching for knowledge. Motivating to self-motivation is a lofty goal, one teachers sometimes forget, or worse still, presume is there when in reality students are no way closer to the teacher's own enthusiasm for a subject. Occasionally, a topic lends itself to wholehearted acceptance and involvement by students. Or sometimes it is the magic charisma of some teachers capable of vivifying even the dullest of subjects, and so "turning on" students to self-motivated learning.

But whatever the form, and whatever the content to be delivered, it must be packaged so that the student (consumer) will be motivated to use it, or at least to try it. Instructional packaging strives to present something in such a way that not only its physical layout is attention-grabbing, but the instructional strategies contained in the package are directed to answering the objectives and purposes of a particular subject.

Alice Kaplan Gordon in Games for Growth has summarized well the roles games play in motivation:

> Educational games are essentially a method of packaging concepts. Games are intrinsically motivating because the form is characterized by several dramatic features that are independent of the subject or issues dealt with. When a student listens to a lecture, participates in a discussion, or reads a textbook chapter, we assume his interest in the subject or at least his motivation to perform well in class. This premise has not proven notably valid for successful teaching and learning. When a student participates in and learns from a game, we merely assume that he shares certain basic human traits. No particular interest in the subject of a game is necessary for involvement in it. For the player, the object of the game is winning. Learning is a by-product, but motivation for further study of the topic frequently results.

Games allow a student to make things happen. Too often the world of education is a passive one for the students: he is lectured to, talked to, drilled at, and graded. It is amazing that education's primary modes of instruction result in such student passivity at precisely those times in human development when one is so very active, so very full of energy, and so very desirous of becoming active agents in effecting the environment about them.

Yet that environment is just too big. So the student retreats from the mammoth world in which he lives and over which he has no control. This retreat does not stop behind the safe doors of his school, for there he encounters still another uncontrollable, overpowering environment. Retreat continues till he has firmly encamped himself behind his desk, terrified to depart, convinced of his inability to affect the environment about him, and resigned to the passive role teacher-directed education lays on him.

Gaming can give him one handle on freedom, one handle at participating in the stream of events about him, one handle which allows him to affect his milieu. In gaming he can become involved. He can debate, bargain, argue, win, lose, leave his scate and shuffle about. And most of all, he can make decisions, good or bad, decisions he quickly discovers, affect the mini-world he so dramatically is acting upon. Gaming as antidote to passiveness provides a strong case for gaming as a motivator.

Then, there's fun. Raised in a work-ethic society, we often falsely assume that only what is painful, difficult and hard is of any real and lasting value. School must be a chore if it is to be effective. The thought that learning might be fun, and enjoyable fills some educators with thoughts of chaos, license, and unbridled activity. Yet learning can and should be fun. The football game, replete with bruised elbows and shins, incomplete passes, and the total exhaustion inflicted by a game hard played, hard won or hard lost is very much a fun-learning experience for even the sorry losers.

It is fun to play at being someone else. It is fun to step out of the daily routine of one's existence and into the shoes of an historical figure, or even only the man down the street. It is the fun of competing actively, of making something happen which serves to make gaming such a real motivator.

Educators agree that feedback is essential to learning/reinforcement. Unlike those tests results several days delayed in being returned or even those thirty ideas that cannot possibly receive adequate responses from one teacher constrained by the time/space structure of today's classroom, gaming provides immediate and intrinsic feedback to the student. The decision he makes affects the game now so that the results are immediately visible to all. Moreover, the student must now suffer the consequences of his actions.

A grade, the right answer on a matching exercise, a test score, all meet the student as a kind of artificial feedback. A wisely made decision may result in a better playing position, more money, better bargaining power, a plan approved and accepted. A poor decision brings home immediately the sorry consequences. Like the real world, the world of game-play hands down no right or wrong answers from above without the participants having some voice in the outcome in the game's outcome. Such immediate and intrinsic feedback aids the motivational impact of a gaming experience.

A game demands new directions in the classroom. The traditional teacher-to-student direction gives way to interaction among the students. This peer interaction, educators are finding, can be directed beyond mere distraction to serve real educational goals. Students learn from one another. When this student interaction is a component of a structured game, learning is increased. Student must often work

in teams.

The concept of the self-sufficient individual is acceding to a more cybernetic realization of man as team member. The team of participants, pooling ideas and resources, effects active change in the structures about them. Each member of the team supplies his best resources and abilities, never fearful that he will be inadequate in the face of the problems with which the team must grapple. Such interaction as provided by game-play becomes a distinct value in arriving at specific educational goals.

Most people are competitive. Most people enjoy competition to some extent. Educational games exploit this natural tendency and harness it for learning purposes. Competition adds an air of expectance, or excitement to what otherwise might be a dull and tedious task. Tapping this instinct to competition increases the motivation in students.

Games demanding a high level of competition, often demand an equally high level of cooperation. Educational games tap this fundamental human urge to cooperate in order to achieve a goal. Such a level of cooperation is in strong contrast to the traditional classroom where cooperation is often condemned in favor of high level individual performance.

The ability of a game to lead the players toward a final goal and to close the game by determining who best reached that goal, is a strongly motivating factor in an educational game. Other media seldom give the student a sense of having reached the given goal of having won or lost. Such a sense of closure is attractive to a student who needs the sense that not only has an activity transpired but that definitely stated goals have or have not been reached to an extent, and that the game is ended because of that.

Student motivation is affected by the introduction of game play which gives the student a close tie to real world situations. A textbook, or filmed presentation can provide the student with a window to the real world's problems or history, but the window provides little possibility for active involvement in the real scene. An educational game creates the temporary aurora of being there, of being the person charged with decisions over real world problems, and of actually acting out and experiencing the problem first hand. Historical issues become more relevant to the student when he must become submerged in the historical or real world setting and when his decisions then must

affect the course and chain of events.

Games for Learning and Growth

Early enthusiasts of gaming pulled it out of its role as mind-diverter, recess period and briber for future "serious work" and raised it to at least the accepted plateau of motivator. Games could motivate and enthuse. Although research's stamp of approval and verification has lagged behind the obviously enthusiastic acceptance by students and teachers, the role educational games played in motivating students is unquestionable.

It has not been, however, until recently that gaming has been seen as a real medium for learning and growth. Games, then, do more than motivate. They provide real information, an understanding of human-socio-economic processes, verbal and interpersonal skill development, the opportunity for developing problem-solving abilities, for making judgmental decisions as well as an intellectual flexibility in approaching problems.

The information accruing from games is not only the transfer of facts, although facts will often serve as the basic building units of a game's structure. The information of which a student discerns in game play is an awareness of the many-sided facets of an issue, an understanding of the social, religious, political or economic inputs to a conflict, and the ability to synthesize the conflict, generalizing its application to other circumstances. The student is given a real opportunity for meeting, head-on, a problem and for solving it. Developing such a skill demands a close correlation of many skills in reviewing and analyzing the situation and arriving at a proper solution.

Gaming offers a more realistic understanding of human-socio-economic processes than can be given from a more passive medium such as the textbook. The experiences are acted out, are simulated with as much a degree of reality as is possible in a simulation game.

The high level of negotiations, bargaining, wheeling and dealing required by most game play affords excellent opportunity for the development of verbal and interpersonal skills. Such skills--thus develop in a more natural way with the focus on the game, its objectives, and purposes, rather than the by-product of skill development. A student must become aware of his own relationships with the other gaming participants. Gaming forces recognition of another's interest, needs and

ability and inability to communicate these to another. For the teacher fearful that this verbal and interpersonal communication will run amuck into verbal and interpersonal chaos, he need only be reminded that the structure of a good game itself aids in keeping the students' direction focused on profitable dialogue.

Gaming provides an intellectual flexibility since the student must always be open to new strategies of play and to alternate routes that another player's decision will take the game. Such intellectual flexibility dispells the right answer syndrome stagnating so much of the educational perspectives.

Teachers and students alike attest to the ability of games to motivate as well as to teach. Unfortunately, research into gaming lags far behind with concrete analysis of just why this is so and what instances gaming is most effective. For the teacher willing to accept the enthusiasm of those who have used educational games, this lack of scientific data should be no stumbling block.

TWO CASE STUDIES

STARPOWER

STARPOWER is a simulation game in which the participants find themselves a part of a three-tiered society. Trading valued chips enables a member of one tier to change his position within the society. For a smooth and unhurried run-through and an adequate post-game discussion, STARPOWER should normally take two hours.

At one particular session we had only one hour with which to work. Therefore, all time periods in the game were halved so that STARPOWER would not take as long as usual. STARPOWER is capable of creating much frustration for those not bettering themselves through the bargaining process and a feeling of superiority and power for those who are doing well. The game's emotion must build up naturally or the end of the game can produce confusion: The stratification of the society is not a truthful stratification, but artificially fabricated by the facilitator. In this particular playing of STARPOWER, the winners did not feel as if they had earned their position and power. Moreover, the losers did not feel beaten by the other players but by a game which randomly contrived the awarding or power, position and such titles as "winner" and "loser". The end result was a game without a "bang". Little involvement was stimulated. The students in this game-play

opted to diminish stratification and to control and use power democratically rather than autocratically. We believe that because the participants were all members of a sociology class that most were aware of and concerned with social problems. Since the leaders were against social norms and the status quo, game-play produced a reaction dissimilar to the low-mobility stratified society the game was attempting to simulate.

Throughout the playing of the game, the participants were more concerned with when the game should end rather than with how it would end. The predominate emotion of the players was an uneasiness and suspense radiating not from person to person but from eye to clock.

The post-game discussion suffered because of the ever-present time factor and also because the game was played with such little enthusiasm. Generalizations were difficult to come by. What generalizations were arrived at, however, were lively, stimulating and constructive. The dominate discussion topic was today's society and how it can exist in a microcosm where people are aware of and have a feeling for justice.

Although no two gaming sessions are ever alike, a group of 30 dental hygienist students in a required course of sociology played STARPOWER in fairly standard fashion. Most participants were enthusiastically involved in the game even though they were unaware what the game was designed to illustrate. After the first bargaining session the class was divided according to the total worth of their chips into three groups: the group with the highest point totals became the Squares; those in the lowest group were designated the Triangles, and those in the middle tier of the society were Circles. After two bargaining sessions, the Squares were afforded power and authority to alter the rules of the game. Although the initial reaction of the Squares was to refuse this right, they eventually succumbed to the temptation to make new rules making it impossible for other groups to believe they had any chance of winning. The Triangles and Circles refused to bargain. Once the Squares ruled that any player refusing to bargain would lose all their points for the round, the Traingles and Circles bolted the game.

The post-game debriefing session included questions and comments about how the game illustrated the way in which our society functions, how a society becomes stratified, what type of value systems support a society, how power is used and abused, and how rebellion is generated

by those without that power.

The two game-plays of STARPOWER pointed up several practical concerns that a game director must have for game-play.

1. Game directions in regard to time are usually critical. Although some games can be shortened most simulations demand the maximum time suggested by the game designer. STARPOWER works best in a two hour period. Any attempt to play it in less time seriously diminishes its effectiveness and jeopardizes the enthusiasm of the participants for not only that particular game but for any half-baked simulation game.
2. A group of gaming participants should be sufficiently "psyched up" to play a game. When the game is seen as a task, a trial, a labor, rather than as a fun and enjoyable opportunity to experience a life situation or process, then the game's ability to teach is nearly lost. Like any of the media, gaming needs its proper preparation and such preparation is not the same afforded the showing of a film nor the delivery of a lecture. Students, unprepared for a particular kind of learning experience will find it difficult extracting from that experience the optimum educational potential.
3. The psychological prepping which takes place before game play must continue through the game. The game director/facilitator must be sensitive to the mood of the group, encouraging it, exciting it, questioning it, working with it when the game seems to be bogging down not so much because of decisions internal to the playing of the game, but because of external factors, such as time, or the environment, whether pleasant or unpleasant.

THE ROAD GAME

Our second case study was with the game THE ROAD GAME. This simulation gives a group the opportunity to observe its own behavior in a conflict-cooperation situation. Divided into four teams, the game participants choose four leaders. Each team and leader is given a quadrant of

a large square of paper which is taped to the floor. With paint and brushes each group is then charged with building roads on their property and that extend through the quadrants of other teams and off the playing paper. Permission to cross roads and to enter other team's properties must be secured before a member can paint through a road. The team with the most roads at the end of the game wins. (Note that prior to the final tallying of roads, each team has the opportunity to charge other teams with property violations and thus diminish another group's total number of roads. This is done in a court hearing at the end of the road building sessions of the game.

The game has been played several times in University classes and throughout the Cincinnati area. All occasions of the game have been met with enthusiasm from the participants. We will note an instance which illustrates a complete picture of the possibilities for THE ROAD GAME.

The playing of THE ROAD GAME involved 150 participants composed of students from high school and college as well as interested parents and teachers. The 150 were divided into three groups and took their places around three playing boards in a large gym. The playing of the game proceeded just as it would for a smaller group. Although only one student at a time could paint roads for his particular quandrant, the remaining students did not loose enthusiasm for the simulation. The non-painters became cheerers, interested spectators, and vociferous advisors to the quandrant's leader when it was time to make decisions about road placement and territorial crossing. Our first concern was that enthusiasm would diminish, with a large group. Yet the contrary was true. Furthermore, with three games proceeding simultaneously, groups began to send out envoys to the other games for reports on how the road building of others compared with their own.

The results of each individual game were similar to game results seen before in the playing of THE ROAD GAME. Yet the value of playing THE ROAD GAME in this fashion came not so much from individual discussions about each game as from a comparison of the painted territories. The three game boards were distinct. In Group A, a group heavily dominated by adults and adult authority, the students had abdicated their authority allowing the adults to make most of the decisions, they produced painted roads intersecting and paralleling in rather

orderly fashion. There were squabbles over violated territory or number of completed roads, but for the most part, the finished playing board was a well-balanced mixture of space and roads. Group B, a group of high school and college students, barely had any roads painted. Most of the gaming session, the teams squabbled and debated over rights of each quadrant. Whereas Group A had built over 40 roads, Group B had not completed five. Group C, composed mostly of high school students, completely eliminated the need for groups to seek permission to cross territories or to build roads. As a matter of fact, this group eliminated all rules and restrictions in regard to the building of roads. Their completed game board was a mass of paint, a kind of ruleless society where anyone did as they pleased and no one really had any rights.

The post-game discussion and debriefing session enabled all the students to compare the three games played and to uncover questions concerning rights and laws, permissiveness, as well as the conflict-cooperation situations that produced such radically different road-built playing boards.

The playing of THE ROAD GAME with such large groups pointed up several things:

1. This particular game can be played and effectively discussed with a large group, larger than indicated by the game's designer.
2. Playing the same game simultaneously with several groups offers an expanded opportunity to discuss not only the developments within the individual games but also how the various gaming tactics compared with one another.
3. This particular game offers the gaming facilitator the possibility of directing the discussion to various areas of concern. Areas can include human behavior, international and local politics, religious studies, and personalities.

GAME PLAY

Some practical suggestions for selecting, preparing for and running a game should serve to help the educator willing to try incorporating this medium in his instructional program design. We are presenting some

very specific steps that a teacher can follow to select an appropriate educational game, to prepare for its play, and finally to administer the game.

The most complete and accurate guide to educational games now commercially available is Robert E. Horn's and David W. Zuckerman's THE GUIDE TO SIMULATION GAMES FOR EDUCATION AND TRAINING (Lexington, Mass.: Information Resources, Inc.; 1970). This resource guide answers just about every question one would have when reviewing a particular game. Information includes the number of players, playing time, the level at which the game can be used, a list of playing materials, objective and purposes, preparation time, evaluative data, and complete purchasing information.

Unlike a textbook which can usually be previewed, simulation games do not lend themselves to easy review without actually playing them. Game distributors seldom forward interested teachers preview copies of games. Feedback on a game and its effectiveness must come to teachers via catalogues such as Zuckerman and Horn's GUIDE or various gaming review publications and journals. (Such resources are indicated in the Bibliography.)

Purchasing a game will usually be a sizable dollar commitment by teacher, department, or school. Keep in mind, however, that although games may cost as much as $60, the reusability of a game often makes it a very good investment, one which actually will cost only pennies per student.

Educational development is moving steadily toward increased interaction between student and curriculum materials as well as student and peers. Such a fundamental change in learning directions does not leave unaltered the role of the teacher in today's classroom. Yet, even with diminished emphasis in the role of teacher as lecturer, his importance in the learning environment is critical and no less diminished. Altered, yes, but his role is still paramount to establishing the proper setting as well as ensuring the smooth functioning of class activity.

Educational games bring home clearly the altered role of the teacher. While students interact with one another, the teacher serves the students so that they can better operate within the game, and thus better achieve the game's objectives.

In game playing, teachers have some very definite homework tasks without which actual game play may not run smoothly.

Having selected a game, a teacher who can identify other colleagues interested in this technique might first play the game with them. Such a preliminary playing gives the teacher a good feel for the operation of the game and helps him uncover any bugs in the game's logistics, problems which might surface during actual game play.

Should time, however, not be available to play the game through, then a teacher can "walk through" a game, familiarizing himself with the game's materials, rules, profile sheets. Games usually come stocked with supplementary materials which describe what the game does and does not teach. Such accompanying materials often suggest how the game materials can be placed, suggestions for post-game discussion and a very handy summary outline of the cyclic steps in a game play.

The question will arise in role playing games as to how the roles should be cast. Practice varies: some teachers allow chance to determine roles; others allow the students to select roles; and still others assign roles. All three methods have their advantages and disadvantages. A teacher will have to decide for himself what approach best suits his class makeup. Some games require monitoring of house-keeping chores such as banking or money collecting. We suggest allowing students to take turns at such roles rather than dumping them upon the "slower" students.

The number of players in a game varies. Most role playing games can accommodate a class of about 30. Board games usually accommodate less and demand multiple copies of the board game with several groups playing simultaneously. In instances where there are too many roles and not enough students, classes may have to be combined. In other instances where students outnumber the given roles in a game, as for instance is often the case with the game Ghetto, we have found that the profile roles can each be played by a team of students. The resulting interactions are often more interesting and lively than when only one person played one profile.

If several games must be played simultaneously then no effort should be made to group the participants according to ability. Such grouping deprives the slower students from learning from the brighter ones.

Before the game begins the teacher makes a brief presentation (up to 15 minutes) in which he covers items as the problems posed by the game, the various actors in the game, the physical layout, and a run-through of the first moves in a game. Such in-class briefing puts a game, its objectives, the actors and the game play, in proper perspective.

As the game proceeds the teacher continues his role as a kind of coach, fielding any questions, not with the air of absolute authority, for there will be no right or wrong answer in the game, but with the intent of facilitating game play.

Questions which arise during play are both non-verbal and verbal. Non-verbal questions will usually manifest themselves in facial expressions or in repressed activity. Such body language is usually asking "How am I playing the game?" "Am I following the rules?" "Am I doing the right thing?" "When will this thing be over?" "What should I do next?" Although gaming facilitators should be sensitive to non-verbal questioning, they should not feel obligated to respond. However, should a player verbalize the non-verbal questions of a group, the gaming director may respond only if answers are needed to facilitate the smooth operation of the game to intensify game-play.

Verbal questioning will include or often demand directions from the director or clarification as to game play. If the director senses that the questions stem from inadequate articulation of the rules before the game began, then he should respond. If, however, the questions attempt to exploit the director's more complete understanding of the game and the directions it can take, then he should avoid responding directly to the participant's questions. Instead, the question should be redirected back to the participant with the suggestion that he reconsider the question--or seek answers from other players.

GAME DISCUSSION AND EVALUATION

Games can be fun, educational, well-prepared for and well-run, but without a discussion afterwards the game is only half complete and half done. Many games are reaching the market complete with handy discussion questions for a follow-up debriefing. However, in the rush to meet the growing demand for new materials, new games are being published without the assistance of some kind of discussion guideline.

Discussions need not be tedious and boring. Indeed they can be an opportunity for the game players and teacher to rediscover the game and better understand what transpired during its play. It is a chance for players to stand back from the trees and see the forest.

We offer some practical suggestions for leading a discussion and evaluation. Begin with what happened. Tabulate and discuss the final scores. Determine why the scores were earned. What would the players do differently if they could replay the game? For students with similar scores, determine if their game behavior was similar.

In discussing scores, keep in mind the effect that chance had on each player. A player may have been hindered in his score by too many negative chance cards. Question the players about the strategies they used in the game. Would certain strategies have worked better under different conditions? for different players? Did the player expect the end of the game to turn out for him as it did?

From questions on game strategy move to more general questions about the game itself: What did the game designer wish to convey by the game? Did he succeed? What rules were valid? What rules need revision? What parts of the game could be modified, changed?

It is in this debriefing discussion that the abilities of the teacher to lead and channel ideas, to relate points, to draw out and to interpret that must come to full force.

Some teachers have utilized videotape during the actual gaming session. Replaying the tape helps everyone to remember what happened and dispells what people think happened in favor of what actually did happen.

Whatever game is selected many teachers have remarked that the most vital process outcome was the essential talk that was executed by the gaming process. In truth, the discussion about players' attitudes or feelings during the game, the significant interactions, the inevitable conflicts or decisions, are the stuff of heavy and useful discussions. The talk that springs from gaming is the talk about experience--as we know it, as the student sees it (correcting our partiality and his; exploring the fullness of his vision, and ours). In making things real, gaming cannot help but give value and meaning to language and learning. Thus gaming invites us into ways of evaluating aspects of life as we experience them. That is the rich promise

of gaming as a process in learning, in discovering through the experience of others.

GAME DESIGN AND ADAPTATION

Perhaps the most creative aspect of educational gaming is the design of original games or the adaptation of already-designed games. The task is indeed frustrating for the game designer or adaptor but the decision and planning process that must go into game design is often more educational than participation in a fully designed game.

This section offers some very basic steps for the design of a game. The approach is necessarily sketchy. However, indications are made in the Bibliography for more extensive reading in this area of game design and adaptation.

Although games will, very in size and format, certain common elements will surface when a game model is being considered. In analyzing a historical event, or a real life present-day setting, crisis or process, consider these following common elements. (Although not a valid simulation of the American economics, the very popular Monopoly can serve to illustrate some of the elements common to all games.)

1. Identify roles. Determine what roles the situation you are simulating requires.
2. Determine the goals that each player will have in the game. What is the player expected to do or achieve by the end of the game? In the game Monopoly, the players' goal is to have a monopoly of land and building holdings, thus eliminating the other players from the game.
3. Provide for a measure of success. Players will want to know if they have reached that goal especially when several players share similar goals. Measurement of success might be in unit points, or in collected chips, or in currency. Players with the same goals, of course, must have identical measures of success if they are to compare their achievement. In Monopoly, the measures of success are money, houses, property and hotels.
4. Allocate resources to the various roles played in the game. A player will need some resources

(whether money or people, or industries, etc.) in order to achieve his goal. Likewise, determine the importance allocated to these resources, that is, the influence they will be able to exert over the course of events or the operations of other players. In Monopoly, the principal resource is money. Each passing of GO brings an added $200 and enables the player to continue in the game.

5. Determine interactions among players. In Monopoly, such interactions include payment of rent when landing on another's property and the buying and selling of land, etc.
6. Determine a sequence of events. A sequence of events should not be so complicated that the player has difficulty remembering or following it during game play. In Monopoly, the sequence is very simple: a dice roll, a movement down the board, the buying or selling of property, or the payment of rent, and the possible taking of a chance or community chest card. The sequence of events should have some point of closure. This closure can be determined by the logical outcome of game play or by some artificial device such as time.
7. Determine external factors. Every game situation--like real life--has conditions which are wholly uncontrollable by the players. Such external factors do, however, affect the decisions and actions of the game's participants. Dice, spinners or cards supply this element of chance to the game. Monopoly relies heavily on chance (the dice throw, chance and community chest cards) for success in the game. Avoid the tendency to incorporate chance elements too heavily in a game. The reliance on chance deprives the participants from being fully effective agents in the game's play.
8. Determine what physical factors affect the outcome of the game. Physical factors may be geographic,

as with a map. Sometimes, however, physical factors are unimportant in a game and a game may boast no board at all.

SUGGESTED INTRODUCTORY GAMES FOR USE IN UNIVERSITY CLASSES

There are several educational games that we would suggest for use in the college classroom. A short description of each game, its playing data, purpose and objectives, as well as purchasing information is presented here.

STARPOWER

age level: any
players: 18-36
time: 1-2 periods each of 50 minutes
preparation time: 20 minutes
description: The participants establish a three-tiered low-mobility society. Trading can result in upward movement. The tier with the most wealth determines the rules for the game. Serves as an excellent medium for illustrating power, and power-structure relationships.
purchasing: $15
Simile II
P.O. Box 1023
La Jolla, Calif. 92037

THE ROAD GAME

age level: college
players: 8-35
playing time: 45 minutes to 2 hours
preparation: 1 hour
description: Teams represent four groups at almost any social level (nations, states, neighborhood groups, etc.). Players attempt to win the game by building roads into other groups' properties. The group with the largest number of roads wins. Decisions involve bargaining and coalition formation.

purchasing: $7.95 (series) readings $.75
Herder and Herder
232 Madison Avenue
New York, New York

CRISIS

age level: college
number of players: 18 to 36 divided into 6 teams
playing time: one class period minimum, no maximum
preparation time: one class period
description: Nations are faced with the problem of resolving a tense situation and guarding national interest regarding a mining area of world prominence. Objectives are to prevent the destruction of nations through war by securing world peace. Participants experience balance of power concepts and the dichotomy of military-peace solutions to international problems. CRISIS is an interactive game with quantitive outcomes achieved through role play.
purchasing: $3 speciman set, 25 for $35, 35 for $50
$8 for forms
Simile II
P.O. Box 1023
La Jolla, Calif. 92037

NAPOLI

age level: college
number of players: 9-33
playing time: 3 periods of 50 minutes
preparation time: 1 period of 50 minutes
description: Members of legislature represent one of two political parties and one of legal geographical regions. Tasks involve working to be re-elected at the end of the session by working toward passage or defeat of each of 11 bills. Play involves decision-making, strategic thinking, bargaining and coalition formation.

purchasing: $3 speciman set, 25 for $35, 35 for $50
$8 for forms
Simile II
P.O. Box 1023
La Jolla, Calif. 92037

SITTE

age level: college
number of players: 15-36 divided into 5 teams
playing time: 1-5 periods of 50 minutes
preparation time: 20-60 minutes
description: Members of interest groups (government, business, tax payers) use their influence to produce changes in the city of Sitte. The game is interactive with elements of both conflict and cooperation. Bargaining, trading, dealing and pressuring serve as vehicles to interest seeking.
purchasing: (same as for NAPOLI)

CLUG

age level: college
special prerequisite: interest in urban economics
number of players: 3-15 divided in 3-5 teams
playing time: 5-7 hours
description: Assuming roles of private enterprize entrepreneurs, teams buy and sell land for construction, industrial development to make a profit. Free form role play involves decisions of property assessment, tax rate, construction and demotion, and trade agreements. CLUG exemplifies the classical principles of urban and retional economics.
purchasing: $125 kit
Systems Gaming Associates
c/o David Sawick
Lansing Apartments
Ithica, New York 14850

THEY SHOOT MARBLES, DON'T THEY?

age level: college

number of players: 12-35

playing time: 1-3 hours

preparation time: little

description: Marbles is a total environment game with marble shooters (the workers) legislators, judge, police, land owners, and other roles interacting throughout the game. Except for a few basic rules, all rules are determined by the legislature. The make-up and efficiency of the functioning environment is determined by the players themselves.

purchasing: The game is not yet available commercially. A composite of the roles and how to construct your own copy of the game is available on request from The University Media Services Center.

APPENDIX A

AN ANNOTATIVE BIBLIOGRAPHY

A Gaming Primer

Abbott, Robert. Abbott's New Card Games. New York, Funk and Wagnalls, 1963.

Abt, Clark C. Serious Games. New York, Viking Press, 1970. Serious Games is a good overall consideration of games, what gaming can do, what it does, as well as what it can do for teacher and student. Trying to popularize simulation games, the author has been criticized for lack of bibliography and references, making it in the eyes of some, a less professional work.

Barton, Richard F. A Primer on Simulation and Gaming. New Jersey, Prentice-Hall, Inc., 1970. Hardly a primer. A rather sophisticated introduction to simulation and gaming for the administrative professions, the behavioral sciences and for education. Heavy emphasis is placed on system consideration and computer (man-computer, all computer) simulations. This is a text for the ardent devotee and lover of simulation gaming.

Bolton, Dale L., Ed. The Use of Simulation in Educational Administration. Columbus, Ohio, Merrill Publisher, 1971.

Boocock, Sarane S. and Schild, E.O., Ed. Simulation Games in Learning. Beverly Hills, California, Sage Publications, Inc., 1968. A collection of articles concerning rationale for gaming, the impact it is having on the learning scene; this work includes good examples of how games have been used, as well as articles on the future of simulation games. Simulation Games in Learning is a valuable part of any simulation library.

Brown, James Wilson, Kenneth D. Norbert. Administering Educational Media; Instructional Technology and Library Services. 2nd edition, New York, McGraw-Hill, 1972.

Davis, Harold S. Instructional Media Center; Bold New Venture. Bloomington, Indiana, University Press, 1971.

Fixx, James. Games for the Superintelligent. New York, Doubleday, 1972. A book of sophisticated games for the above average including math applications, puzzles, and games.

Inbar, Maurice and Stoll, Clarice S. Simulation and Gaming in Social Science. New York, The Free Press, 1972.

Kaplan, Alice Gordan. Games for Growth. Palo Alto, California, Science Research Associates, Inc., 1970. A very interesting and informative work surveying all aspects of gaming. Easy and quick reading for the teacher interested in immediate information about gaming.

Lewis, Darrell R. and Wentworth, Donald. Games and Simulation for Teaching Economics. Joint Council on Economic Education, 1971.

Opie, Iona and Peter. Children's Games in Street and Playground. London, W.I., Oxford University Press, 1969. For a basic understanding of the nature of play, this work is intriguing for someone very interested not only in simulation gaming but in child development in relation to play and play techniques.

Raser, John R. Simulation and Society. Boston, Massachusetts, Allyn and Bacon, Inc., 1969.

Twelker, Paul A., Ed. Instructional Simulation Systems. Oregon, Continuing Education Publications, 1969. One of the first attempts to gather together under one roof materials, articles, and games dealing with simulations. Although a bit outdated and not as reliable as the new Guide to Simulation Games for Education and Training (Zuckerman & Horn), this is still helpful.

Zuckerman, David W. and Horn, Robert E. The Guide to Simulation Games for Education and Training. Cambridge, Massachusetts, Informal Resources, 1970. A basic reference on simulation and gaming.

APPENDIX B

A SELECTED BIBLIOGRAPHY

Reproduced with permission of the Center for Social Organization of Schools, The Johns Hopkins University. Compiled by Steven J. Kidder, Ph.D.

Abelson, Robert P. "Simulation of Social Behavior". In Handbook of Social Psychology. Cambridge, Mass.: Addison-Wesley, 1969.

Abt, C.C. Survey of the State of the Art: Social, Political and Economic Models and Simulations. Cambridge, Mass.: ABT Associates, Inc., 1965.

Abt, C.C. Serious Games. New York: The Viking Press, 1970.

Anderson, C. Raymond. "Measuring Behavioral Learnings: A Study in Consumer Credit". The Center for Social Organization of Schools Report No. 67, The Johns Hopkins University, May, 1970.

Bem, D.J. "Group Influence on Individual Risk-Taking". Journal of Abnormal and Social Psychology, Vol. 65, No. 2, 1962, pp. 75-86.

Berkeley, Ellen P. "The New Gamesmanship: A Report on the New Urban Games, Played not so Much for Fun as for an Understanding of the Complexities of Urban Problems". Architectural Forum, December, 1968, 129-58-63.

Boguslaw, R. and Davis, Robert H. "Social Process Modeling: A Comparison of a Live and Computerized Simulation". Behavioral Science, 11, No. 1, 1966, pp. 43-62.

Boocock, Sarane S. "Toward a Sociology of Learning: A Selected Review of Existing Literature". Sociology of Education, Winter, 1966, pp. 1-45.

Boocock, Sarane S. "The Life Career Game". Personnel and Guidance Journal, December, 1967, pp. 328-334.

Boocock, Sarane S. and Coleman, James S. "Games with Simulated Environments in Learning". Sociology of Education, Summer, 1966.

Boocock, Sarane S., Schild E.O. and Stoll, Clarice S. "Simulation Games and Control Beliefs". The Center for Social Organization of Schools Report No. 10, The Johns Hopkins University, November, 1967 (131 pages).

Boocock, Sarane S. and Schild, E.O. (eds.) Simulation Games in Learning. Beverly Hills, Calif.: Sage, 1968.

Boocock, Sarane S. "Instructional Games". Encyclopedia of Education, New York: Macmillan Company, forthcoming.

Browning, R.P. "Interaction of Personality and Political System in Decisions to Run for Office: Some Data and a Simulation Technique". Journal of Social Issues, 24, July, 1968, pp. 93-109.

Cohen, K.J. "The Role of Management Games in Education and Research". Management Science, Vol. 7, 1961, pp. 131-166.

Coleman, James S. et al. (eds.) Simulation Games and Learning Behavior, Parts I and II, special issues of American Behavioral Scientist, Vol. 10, October and November, 1966.

Coleman, James S. "Analysis of Social Structures and Simulation of Social Processes with Electronic Computers". In Guetzkow, Harold S. (ed.) Simulation in Social Science, Englewood Cliffs, New Jersey: Prentice-Hall, 1962, pp. 61-67.

Coleman, James S. The Adolescent Society. New York: Free Press, 1961, Chapter XI.

Coleman, James S. "Learning Through Games". National Education Association Journal, 56, (1), January, 1967, pp. 69-70.

Coleman, James S. "Simulation Games and Social Theory". American Behavioral Scientist, 12, July-August, pp. 2-6.

Coleman, James S. "Game Models of Economic and Political Systems". The Study of Total Societies, Samuel Z. Klausner (ed.) New York: Anchor Books, 1967, pp. 30-44.

Coleman, James S. "Games--New Tools for Learning". Scholastic Teacher, 15, (8), November, 1967.

Danielian, J. "Live Simulation of Affect-Laden Cultural Cognition". Journal of Conflict Resolution, 11, 1967, pp. 312-324.

Davis, M.D. Game Theory: A Nontechnical Introduction. New York: Basic Books, 1970.

Druckman, Daniel. "Ethnocentrism in the Inter-Nation Simulation". Journal of Conflict Resolution, 12, No. 1, 1968, pp. 45-68.

Duke, R.D. "Gaming Urban Systems". Planning 1965, pp. 293-300.

Duke, R.D. "Gaming Simulation for Urban Planning". Journal of the American Institute of Planners, Vol. 32, No. 1, January, 1966, pp.3-17.

Esherick, J. "A Laboratory to Facilitate Computer-Controlled Behavioral Experiments". Administrative Science Quarterly, Vol. 14, June, 1969, pp.202-207.

Fattu, N.A. "An Introduction to Simulation". In Simulation Models for Education, N.A. Fattu and S. Elam (eds.) Bloomington: Phi Delta Kappa, 1965.

Feldt, Allan G. "Operational Gaming in Planning Education: General Description of the Cornell Land Use Game..." American Institute of Planners Journal, 32, 1966, pp. 17-23.

Gamson, W.A. Simsoc: Simulated Society. (with Instructors Manual) New York: Free Press, 1969.

Guetzkow, Harold (ed.) Simulation in Social Science: Readings. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.

Guthery, Scott B. "GLEAP: A General Program for Game Learning Simulation". Behavioral Science, 13, 1968, pp. 336-342.

Harsanyi, J.C. "A General Theory of Rational Behavior in Game Situations". Econometrica, Vol. 34, No. 3, July, 1966, pp. 613-634.

Helmer, O. A Use of Simulation for the Study of Future Values. Santa Monica: The Rand Corporation, 1966, pp. 34-43.

Hoggatt, A.C. A Time-Sharing Methodology for Constructing Social Simulations. Berkeley: University of California, Center for Research in Management Science, Working Paper No. 306, 1970.

Inbar, Michael. "Development and Educational Use of Simulation: An Example--'The Community Response Game'". Scientia Paedagogica Experimantalis, IV, (1), 1969, pp. 5-44.

Inbar, Michael and Stoll, Clarice S. Simulation and Gaming in Social Science: The Design Process. New York: Free Press, 1970, (in press).

Inbar, Michael and Stoll, Clarice S. "Games in Learning". Interchange, 1, (2), 1970.

Inbar, Michael. "Toward a Sociology of Autotelic Behavior". La Critica Sociologica, No. 14, Summer, 1970.

Katz, R. A Computer Program for an Oligopoly Business Game. New Haven: Yale University, Technical Report No. 6, 1970.

Kelley, H.H., Thibaut, J.W., Radloff, R., and Mundy, D. "The Development of Cooperation in the Minimal Social Situation". Psychological Monographs, 76, 1962.

Kirlin, J. "The Inter-Community Simulation". Ph.D. Dissertation, University of California at Los Angeles, 1969.

Knapp, W.M. and Podell, J.E. "Mental Patients, Prisons, and Students with Simulated Partners in a Mixed Motive Game". Journal of Conflict Resolution, 12, 1968, 235-241.

Kogan, N. "Group Influence on Individual Risk-Taking". Journal of Abnormal and Social Psychology, Vol. 65, No. 2, 1962, pp. 75-86.

Kogan, N. "The Roles of Information, Discussion, and Consensus in Group Risk Taking". Journal of Experimental Social Psychology, Vol. 1, 1965, pp. 1-19.

Livingston, Samuel A. "Simulation Games and Attitude Change: Attitudes Toward the Poor". The Center for Social Organization of Schools Report No. 63, The Johns Hopkins University, April, 1970.

Livingston, Samuel A. "Simulation Games as Advance Organizers in the Learning of Social Science Materials: Experiments 1-3". The Center for Social Organization of Schools Report No. 64, The Johns Hopkins University.

Livingston, Samuel A. and Stoll, Clarice S. Simulation Games: An Introduction for the Social Science Teacher. New York: Free Press, (in press).

Markley, O.W. "Simulation of SIVA Model of Organizational Behavior". American Journal of Sociology, 73, 1967, pp. 339-347.

Meeker, R.J. "A Personality/Attitude Schedule for Use in Experimental Bargaining Studies". The Journal of Psychology, Vol. 65, 1967, pp. 233-252.

Meier, R.L. "Gaming Simulation for Urban Planning". Journal of the American Institute of Planners, Vol. 32, No. 1, January, 1966, pp. 3-17.

Nagelberg, Mark. Simulation of Urban Systems--A Selected Bibliography. Institute for the Future, Middletown, Connecticut, January, 1970.

Nagelberg, Mark and Little, Dennis. Selected Urban Simulations and Games, Institute for the Future, Middletown, Connecticut, March, 1970.

Nesbitt, William A. Simulation Games for the Social Studies Classroom. (revised edition), New York: Foreign Policy Association, 1968.

Pool, Ithiel DeSola. "Simulation Social Systems". International Science and Technology, 27, 1964, pp. 62-71.

Rapoport, A., and Guyer, M. A Taxonomy of 2 X 2 Games. Ann Arbor: The University of Michigan, Mental Health Research Institute, 1968.

Rapoport, A. "Prospects for Experimental Games". Journal of Conflict Resolution, 12, 1968, pp. 461-470.

Raser, John R. Simulation and Society. Boston: Allyn & Bacon, Inc., 1969.

Ruffin, W. Urban Crisis. Kansas State College, Pittsburg, Kansas, 1970.

Schelling, T.C. "Experimental Games and Bargaining Theory". World Politics, 14, 1961, pp. 47-68.

Shubik, M. Game Theory and Related Approaches to Social Behavior. New York: John Wiley & Sons, 1964.

Shubik, M. The Dollar Auction Game: A Paradox in Non-Cooperative Behavior and Escalation. New Haven: Yale University, Department of Administrative Sciences, Report No. 30, 1970.

Shure, G.H. "A Computer-Based Experimental Laboratory". Administrative Science Quarterly, Vol. 14, No. 2, June, 1969, pp. 286-293.

"Simulation". International Encyclopedia of the Social Sciences, Vol. 14, New York: Macmillan and the Free Press, 1968, pp. 262-281.

Smoker, P. "Social Research for Social Anticipation". American Behavioral Scientist, 12, 1969, pp. 7-13.

Stoll, Clarice S., Inbar, Michael, and Fennessey, James. "Game Experience and Socialization: An Exploratory Study of Race Differences". The Center for Social Organization of Schools Report No. 31, The Johns Hopkins University, 1969.

Stoll, Clarice S. and McFarlane, Paul, T. "Player Characteristics and Strategy in a Parent-Child Simulation Game". Sociometry, 32, September, 1969, pp. 259-272.

Stoll, Clarice S. "Simulated Environments". Chapter prepared for Robert B. Smith (ed.), Social Science Methods, New York: Free Press, (in press).

Stoll, Clarice S. and Inbar, Michael. "Game Experience and Socialization: An Exploratory Study of Race Differences". Sociological Quarterly, Summer, 1970.

Stoll, Clarice S. "The Non-Course: Innovation in the Undergraduate Curriculum". The Center for Social Organization of Schools Report No. 59, The Johns Hopkins University, February, 1970. Published version appears in American Sociologist, August, 1970.

Terhune, Kenneth and Firestone, Joseph M. "Psychological Studies in Social Interaction and Motives (SIAM) Phase 2: Group Motives in and International Relations Game". CAL Report No. VX-20 18-G-2, Buffalo: Cornell Aeronautical Laboratory, Inc., March, 1967.

Turner, T.B. "World Game Pattern Recognition for Resource Utilization Planning". Paper given at 1970 Association for Computing Machinery Meetings, September, 1970.

Wallace, Donnel and Rothaus, Paul. "Communication, Group Loyalty, and Trust in the PD Game". Journal of Conflict Resolution, 13, No. 3, 1969, pp. 370-380.

Wallach, M.A. "Group Influence on Individual Risk-Taking". Journal of Abnormal and Social Psychology, Vol. 65, No. 2, 1962, pp. 75-86.

Wallach, M.A. "The Roles of Information, Discussion, and Consensus in Group Risk-Taking". Journal of Experimental Social Psychology, Vol. 1, 1965, pp. 1-19.

Weil, Roman L., Jr. "The N-Person Prisoner's Dilemma: Some Theory and a Computer Oriented Approach". Behavioral Science, 11, No.3, May, 1968, pp. 227-234.

Werner, Roland and Werner, John T. Bibliography of Simulations: Social Systems and Education. La Jolla, Calif.: Western Behavioral Sciences Institute, 1969.

Whited, M. "The Implementation of a Political Simulation: The Woodbury Model". Paper read at the Midwest Political Science Association Meeting, 1969.

Wilson, J.P. and Adams, D.E. "A Selected Bibliography of Simulations and Related Subjects, 1960-1969". Department of Political Science, Kansas State College, Pittsburg, Kansas, April, 1970.

Wolf, G. Interpersonal Systems. New Haven: Yale University, Technical Paper, 1970.